What is Claimed is:

1. A composite sandwich structure with embedded electronics comprising:

first and second multilayer composite facesheet laminates made of structural fiber reinforced material;

first and second multilayer circuit laminates made of low dielectric fiber reinforced material with electrically conducting printed circuits embedded between low dielectric plies;

a core structure;

electronic components located in a central region where said core structure is located and having electrical conducting pins in contact with and secured to said printed circuits within either of said multilayer circuit laminates;

2. The composite sandwich structure of claim 1, wherein said structural fiber reinforced material includes at least one of a carbon, ceramic, glass, or high-density polyethylene.

3. The composite sandwich structure of claim 1, wherein said structural fiber reinforced material is a matrix material including thermoset polymer or thermoplastic polymer.

4. The composite sandwich structure of claim 1, wherein said circuit laminates include reinforcement fibers that are woven or non-woven low dielectric material.

5. The composite sandwich structure of claim 1, wherein said circuit laminates include fiber reinforced matrix material with a low dielectric thermoset polymer, thermoplastic polymer, ceramic, or ceramic particulate filled polymer.

6. The composite sandwich structure of claim 1, wherein said first and second multilayer circuit laminates are located on opposite sides of said core structure, and said multilayer circuit laminates in said core structure are sandwiched between said first and second multilayer composite facesheet laminates.

7. The composite sandwich structure of claim 6, wherein said first multilayer composite facesheet laminate is bonded to said first multilayer circuit laminate, and said second multilayer composite facesheet laminate is bonded to said second multilayer circuit laminate.

8. The composite sandwich structure of claim 7, wherein said multilayer composite facesheet laminates are bonded to said multilayer circuit laminates with a resin that is subsequently cured.

9. The composite sandwich structure of claim 7, wherein said multilayer composite facesheet laminates are bonded to said multilayer circuit laminates using an adhesive after said laminates have been cured.

10. The composite sandwich structure of claim 1, wherein said electronic components include redundant circuitry and components, which can be activated if equivalent components or circuitry have malfunctioned or failed.

11. The composite sandwich structure of claim 10, further including a signal control device to sense if the equivalent components of circuitry have malfunctioned or failed and a switch to electronically reconfigure the circuitry to isolate the equivalent components or circuitry that have malfunctioned or failed and activate said redundant circuitry and components.

12. The composite sandwich structure of claim 1, further including at least one heat sink lead thermally connected to a heat generating electronic component within the composite sandwich structure and thermally connected to a heat sink outside the composite sandwich structure.

13. The composite sandwich structure of claim 12, wherein said heat sink lead extends through said core structure and out of the composite sandwich structure therefrom.

14. The composite sandwich structure of claim 12, wherein said heat sink lead extends through one of said first or second multilayer circuit laminates and one of said first or second multilayer facesheet laminates.

15. A composite sandwich structure for use as a structural element with embedded electronics comprising:

first and second outer structural layers;

first and second circuit layers sandwiched between said first and second structural layers;

a core structure sandwiched between said first and second circuit layers; and

electrical components located in a central core region defined by said core structure and electrically connected to at least one of said circuit layers.

16. The composite sandwich structure of claim 15, when said core structure includes truss elements.

17. The composite sandwich structure of claim 17, including a third circuit layer attached to said truss elements.

18. The composite sandwich structure of claim 17, wherein at least some of said electronic components are mounted on and electrically connected to said third circuit layer.

19. The composite sandwich structure of claim 15, further including flexible circuitry members electrically connected to and extending between said first and second circuit layers.

20. The composite sandwich structure of claim 15, wherein said core structure includes a plurality of layered core members of differing materials, at least one of said materials being porous to allow air flow for cooling said electronic components.